CLAIMS:

1. A color electrophoretic display comprising at least one pixel (200) operative to display visible light in a predetermined range (101, 102, 103) of wavelengths, each pixel (200) comprising at least two sub-pixels (210, 220, 230) which each comprise:

a color filter operative to absorb a fixed sub-range (107, 108, 109) of said predetermined range (101, 102, 103) of wavelengths;

an electrophoretic media comprising two types of particles (201, 202, 203), each type of particle being operative to absorb a second and third sub-range (107, 108, 109; 104, 105, 106) of said predetermined range (101, 102, 103) of wavelengths, respectively; and

means (511, 512, 521, 522) for separately controlling the spatial distribution of the respective particles (201, 202, 203) in said electrophoretic media between visible (530) and invisible locations (510, 520);

wherein said fixed sub-ranges (107, 108, 109) of the respective sub-pixels in each pixel are essentially non-overlapping and in combination cover essentially all of said predetermined range of wavelengths (101, 102, 103); and

wherein, in each sub-pixel, said second and third sub-ranges (107, 108, 109) are different from each other, and cover essentially all of said predetermined range (101, 102, 103) of wavelengths only in combination with the fixed sub-range of the related sub-pixel.

2. A color electrophoretic display according to claim 1, wherein the color filter is a color filter element (211, 221, 231).

3. A color electrophoretic display according to claim 1, wherein the electrophoretic media comprises the color filter as a colored fluid.

4. A color electrophoretic display according to claim 1 or 2, wherein said color filters (211, 221, 231) and said particles (201, 202, 203) are operative to transmit wavelengths that are not absorbed.

5. A color electrophoretic display according to claim 1 or 2, wherein said predetermined range (101, 102, 103) of wavelengths substantially covers the entire spectrum of visible light.

6. A color electrophoretic display according to claim 1 or 2, wherein each pixel (200) comprises three sub-pixels (210, 220, 230) in which the fixed sub-ranges of the filter elements (211, 221, 231) cover red (107), green (108), and blue (109) wavelengths, respectively, such that the respective filter elements are operative to transmit cyan, magenta, and yellow light waves, respectively.

7. A color electrophoretic display according to claim 1 or 2, wherein said particles (201, 202, 203) are operative to absorb red (107), green (108) or blue (109), wavelengths, respectively, and thus to transmit cyan, magenta, or yellow wavelengths.

8. A color electrophoretic display according to claim 1 or 2, wherein said particles are operative to absorb cyan (105), magenta (106), or yellow (104) wavelengths, respectively, and thus to transmit red, green or blue, wavelengths.

9. A color electrophoretic display according to claim 1 or 2, wherein said two particle types in each sub-pixel have different polarities.

10. A color electrophoretic display according to claim 2, wherein said electrophoretic media in each sub-pixel (500) is contained in a visible pixel volume (530), providing for said visible locations, and in two reservoirs (510, 520), each reservoir providing for invisible locations for particles of respective type.

11. A color electrophoretic display according to claim 10, wherein said means for separately controlling the spatial distribution of the respective particles comprises data electrodes and reset electrodes (511, 512, 521, 522) arranged in each reservoir.

12. A color electrophoretic display according to claim 10, wherein said reservoirs (510, 520) are covered by a black matrix (513, 523) such that particles residing in the respective reservoir are made invisible.

13. A color electrophoretic display according to claim 1 or 2, wherein each sub-pixel (500) comprises a reflector (531) reflective for light in said predetermined range of wavelengths, such that ambient light transmitted through said color filter element and through said electrophoretic media is reflected back and retransmitted through said color filter element.

14. A color electrophoretic display according to claim 1 or 2, further comprising a light source (631, 632) operative to emit light in said predetermined range of wavelengths through said color filter elements and through said electrophoretic media.

15. A color electrophoretic display according to claim 1 or 2, wherein said particles are all chosen from a group consisting of:

positively charged particles operative to absorb wavelengths of a first color,

negatively charged particles operative to absorb wavelengths of a second color,

positively charged particles operative to absorb wavelengths of a third color, and

negatively charged particles operative to absorb wavelengths of said third color,

such that the total number of particle types in the display is four.

16. A color electrophoretic display according to claim 1 or 2, wherein said electrophoretic media in at least one sub-pixel comprises a third particle type which is operative to absorb essentially the same sub-range of wavelengths as the corresponding color filter element in that sub-pixel.

17. A method of manufacturing a color electrophoretic display according to claim 1 or 2, using a ink-jet printing technology for filling said pixels with said electrophoretic media.

18. A method for driving a color electrophoretic display according to claim 10, comprising the steps of:

resetting (701, 801) each sub-pixel by moving the particles to their respective reservoir;

receiving pixel image information regarding an image to be displayed;

determining a particle mixture corresponding to said image; and

filling (703, 704; 803, 804) each pixel volume with color particles thus forming said particle mixture.

19. A method according to claim 18, wherein the step of resetting (701, 801) each sub-pixel comprises the sub-step of:

applying reset voltages to reset electrodes in each sub-pixel,

and wherein the step of filling each pixel volume comprises the sub-steps of:

applying (703, 704) a fill voltage to said reset electrodes, said fill voltage being lower than said reset voltages,

controlling the number of particles entering each pixel volume by applying control voltages to data electrode in each sub-pixel;

removing (707, 708) any excess particles from the pixel volume by increasing the control voltages.

20. A method according to claim 18, wherein the step of filling each pixel volume is carried out simultaneously for both particle types in each sub-pixel.

21. A method according to claim 18, wherein the step of filling each pixel volume is carried out sequentially for each particle type in each sub-pixel.